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Bacteriological Methods for the Large-scale Detection of Mastitis

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The importance in war-time of milk production and the prevention of disease and other factors known to decrease the milk yield[1 2 3] and to lower its quality[4 5], has caused agriculturalists and veterinarians to take a more serious and comprehensive view of the problems associated with bovine mastitis. From a war-time aspect mastitis is of most consequence because it lowers the nutritive value of milk, adversely affects its keeping quality[6], and reduces the yield and quality of cheese made from infected milk[7 8 9 10].

The ubiquity of the disease and the widespread realisation of its serious economic effects emphasise the necessity for an early attack upon the problem in the simplest and most efficient manner. The well-known work of Minett, Stableforth and Edwards[11] has provided us with an admirable technique when time and money are no object, but one which is hardly practicable for the systematic testing of the 3,000,000 cows in milk in the country. This technique requires centrifuging and plating in a blood medium and, in many cases, the picking-off and typing by serological or biochemical methods of suspected colonies. It will, of course, be obvious that many hundreds of trained and experienced bacteriologists and well-equipped laboratories would be a *sine qua non* for the general application of this technique to all the herds in the country. It follows, therefore, that the first essential to any national scheme of diagnosis and eradication or control is a simple and economic technique for detecting the disease. Mastitis is primarily a bacteriological problem and the detection of the causative organism in the milk is generally accepted as the safest criterion of the presence of the disease. The chemical and physiological changes in the milk from infected udders have been used as the basis for a number of indirect tests, but it has been shown that not one of these is a reliable test[12 13]. The azide broth technique has recently attracted much attention[14]. While it is undoubtedly of great use as a quick method of detecting the majority of cases of infection with *Str. agalactiae*, its limitations are such that the writer has no confidence in any method other than plating *freshly taken samples* in a *non-inhibitory medium* and picking off and *confirming colonies*. H. J. Rogers and the writer have found that the results with azide broth sometimes correlated well with those of plating methods. At other times, however, the agreement has not been good. Light infections may be missed and infections other than those due to *Str. agalactiae* confuse the issue. Attempts have been made to combine the azide broth with the hippurate hydrolysis test to increase its specificity, but without success. Some staphylococci grow in azide broth and hydrolyse hippurate. The value of the indirect tests is that some, like the strip-cup and the bromcresol purple tests, are so simple that the farmer himself can obtain an estimate of the incidence of mastitis in his herd, and in the laboratory they serve as a useful check on the results of the more precise tests. At present it is important to find a simple method of showing the presence of *Str. agalactiae* and other organisms known to cause mastitis in the udders of all the cows in this country. Previous work by the writer and his colleagues[15] has served to emphasise the importance of the following points in framing a technique :—

1. Samples must be taken under aseptic conditions by trained workers.
2. Afternoon samples are preferable for obvious reasons.
3. Organisms other than *Str. agalactiae* may cause a subclinical mastitis. Although perhaps not contagious in the sense that *Str. agalactiae* is, these other forms are of economic importance and it is unwise to ignore them[16]. It is essential, therefore, to use a non-inhibitory medium which will grow *Str. dysgalactiae* (Minett Group II), *Str. uberis* (Minett Group III), *Str. pyogenes* (bovine), staphylococci and micrococci.
4. It is never safe to diagnose a plate merely on inspection. The use of blood has tended to over-emphasise the importance of haemolysis. Indeed the writer has known of cases where plates are rapidly inspected and diagnosed on haemolysis alone. Moreover, colonies cannot be always safely typed as α, α^1, β or γ, and *Str. agalactiae* can give all types of haemolysis from nothing (γ) to a wide-zoned β that is characteristic of *Str. pyogenes*. The type of haemolysis is dependent on many factors[17 18 19]. In all cases, therefore, colonies must be picked off and confirmed.

In the technique to be described the above aspects are given due weight. Confirmation is obtained by simple cultural tests and biochemical reactions and the results checked by the resazurin-rennet test[20].

Description of Technique

Outline of Method.—Afternoon samples are taken aseptically and removed immediately to the laboratory, where they are plated in blood- or bromcresol purple lactose chalk-agar and a resazurin-rennet test performed. After incubation of the plates, colonies are transferred to yeast litmus milk, the cultures incubated and inspected and a catalase test carried out. In cases of doubt a further culture in aesculin hippurate broth and other media may be necessary.

Advantages of the Method.—Centrifuging and the use of blood are unnecessary. A minimum of time, labour and apparatus is required. Extensive experience and complicated tests are not necessary, and the media are easily prepared and stored.

DETAILED DESCRIPTION

It is essential for a trained bacteriologist or assistant to be present at the sampling. It is advisable to take a clean towel and a chlorine disinfectant for the treatment of the water used for washing the udders and also for the cowman to rinse his hands in. Samples are best taken by the head cowman. About six streams are removed from each quarter before taking the sample. Only 11 ml. are actually required for the testing but it is advisable to take at least 1 oz., preferably about 4 oz. Sterile bottles or tubes may be used and these should be labelled in fours for convenience in checking, missing a number when the quarter is blind. The bacteriologist or assistant labels the bottles and sees that the necessary precautions are observed in taking the samples.

The milks are taken immediately to the laboratory and should either be tested within three hours of milking or placed at once on the floor of a refrigerator and tested next morning. This expedient is satisfactory as very little change occurs bacteriologically or physiologically in aseptically taken milk held at 0° C. over a period of 18 hours[21]. Two tests are performed—the resazurin-rennet, and plating in a non-inhibitory medium.

Plating the Milks.—Petri dishes are put out and numbered, two for each quarter sample. One ml. and 0·1 ml. of each milk are then transferred in the usual way to the plates. If there is a shortage of plates, $\frac{1}{2}$, $\frac{1}{3}$ or $\frac{1}{4}$ ml. may be used in place of the two dilutions. The udder count of uninfected cows has been shown to be under 300[6]; infected milks frequently have considerably higher counts so that a smaller quantity must be plated in order to permit picking off colonies.

Either blood- or BCP lactose chalk-agar may be used.

PREPARATION OF MEDIA

(i) *Blood agar.*

3 gm. peptone, 3 gm. Lemco, 3 gm. Yeastrel — or — 10 gm. peptone, 10 gm. Lemco
5 gm. sodium chloride
15 gm. agar
1,000 ml. tap water

Adjust to *p*H 7·4 using phenol red in a comparator and tube in 10 ml. quantities. When plating, melt and cool to 50° C., add 0·5 ml. defibrinated blood to each tube, mix well and pour. Always pour control uninoculated plates.

(ii) *Bromcresol purple lactose chalk agar*[22].

3 gm. peptone
3 gm. Lemco
3 gm. Yeastrel
10 gm. lactose
10 ml. separated milk
15 gm. agar
50 ml. of 0·04 per cent. bromcresol purple solution
10 gm. precipitated chalk (fine)
1,000 ml. tap water

Adjust to *p*H 6·8 before adding the indicator, using bromthymol blue in a comparator. It is most important to keep the chalk well shaken up during filling out. Alternatively 1/10 gm. chalk may be added direct to each tube by means of a calibrated scoop. The medium may advantageously be filled out into screw-capped McCartney bottles as mixing the chalk is facilitated. The chalk should be hot-air sterilised previously; on no account wet-sterilise as this results in the chalk "caking" in the medium.

Treatment of Plates.—The plates are incubated at 37° to 40° C. for at least two days and then examined. The appearance of colonies of the relevant organisms is summarised in Table I.

TABLE I

Organism.	Colonies in	
	Blood Agar.	BCP Lactose Chalk Agar.
Str. agalactiae	Small clear, sometimes β or weak β haemolysis	Small. Sharply defined zones°.
Staphylococci		
(Surface)	Large, usually orange and β haemolytic	Large, usually orange. No zones*.
(Depth)	Medium, non-haemolytic	Medium. Ill-defined zones*.
Str. dysgalactiae	Small, clear, non-haemolytic	Small. Clear zones°.
Str. uberis	Medium, non-haemolytic	Medium. Clear zones°.
Str. pyogenes (bovine)	Very small, strongly β haemolytic	Very small. Weak zones°.
Micrococci	Medium, non-haemolytic	Medium. No zones*.

Of these two media, blood agar gives the most information about the streptococcal colonies. However, as the BCP medium can be flooded with 1 per cent. (3 vol.) hydrogen peroxide preferably adjusted to *p*H c.6 (grey-green to bromcresol purple) to distinguish the catalase-positive colonies (marked * above)[15], there is, from all points of view, not much difference between them. All streptococci are catalase-negative (marked ° above). The choice of medium will depend on the availability of blood and the personal preference of the worker. In performing the catalase test on plates, care must be taken that hydrogen peroxide is not poured over the colony to be picked off. It is best to flood half the plate and after about one minute to examine the colonies with a lens for *continuous* tiny bubbles.

Suspected colonies are next picked off into yeast litmus milk[23] or aesculin ferric chloride yeast litmus milk[24]. The latter is probably the best single medium for the diagnostic culture of *Str. agalactiae*, but aesculin is now difficult to obtain and yeast litmus milk is nearly as good. After incubation at 37° to 40° C. for two days the tubes are examined, recorded (see [25]) and tested for the presence of catalase as follows:—

One ml. of 20 vol. hydrogen peroxide is added to each tube and the tube shaken. After one minute the tube is examined; froth on the surface indicates that the organism is catalase-positive (*i.e.* that it is a staphylococcus or micrococcus (probably)), absence of froth that it is catalase-negative (*i.e.* that it is a streptococcus)[26]. The litmus milk cultures are recorded as follows (Table II).

TABLE II

Recording.	Description.	Catalase.	Inference.
A C	Acid and clot without reduction	O	*Str. agalactiae*
A C V ¼in.	Acid and clot, partial reduction to ¼in. from surface	+	Staphylococcus
A C R 1in. (about)	Acid and clot, complete reduction to about 1in. from the surface	O	*Str. dysgalactiae* or *Str. uberis*
A	Acid only	O	*Str. pyogenes*
—	No change	+	Micrococcus
A C R ¼in.	Acid and clot, complete reduction to about ¼in. from the surface	O	*Str. lactis*

Str. lactis and other contaminants are rare in properly taken samples.

The reactions of *Str. agalactiae*, *Staphylococcus* and *Micrococcus* are characteristic and no further confirmation is necessary. In all other cases it is essential to carry out further tests. For this purpose a choice can be made from the data given in Table III.

TABLE III

Organism.	Microscopic appearance.	Growth at 15° C.	Yeast litmus milk.	Hydrolysis of hippurate.	Haemolysis in blood agar.
Str. dysgalactiae	Diplococci & short chains	Slow	Acid, clot, complete reduction to a variable extent	O	O
Str. uberis	"	+	"	+	O
Str. pyogenes (human & bovine)	Long chains	O	Acid, clot	O	β
Str. lactis	Diplococci	+	Acid, clot, complete reduction to ¼in. from surface	+	O

Sugar Fermentations

Organism.	Aesculin.	Mannitol.	Sorbitol.	Trehalose.	Salicin.	Starch.	Inulin.
Str. dysgalactiae	O	O	O	±	O	O	O
Str. uberis	+	+	O	O	+	+	+
Str. pyogenes							
(human)	+	±	O	+	±	O	O
(bovine)	O	O	+	O	+	+	O
Str. lactis	+	±	O	+	+	O	O

Sugar reactions are variable so that too rigid an interpretation should be avoided. It is always advisable to add yeastrel or some similar source of growth factors to the broth as peptones are very variable in their content[27].

In those rare cases where the organism appears to be *Str. agalactiae* but gives slightly atypical reactions in yeast litmus milk[28], the simplest procedure is to inoculate into aesculin hippurate broth[29], these two media being quite sufficient to identify *Str. agalactiae*.

Plating methods, such as that described, will detect all cases of *all* types of mastitis (a most important point) except in two instances, (*a*) when blood, etc., is present in the sample in considerable quantity in which case a sterile plate may be obtained[6], and (*b*) when the milk only contains very few of the mastitis organisms. In the former case the condition is clinical and in any case is easily detected by the resazurin-rennet test, and in the latter it is necessary to resort to enrichment methods such as those described by Mattick, Shattock and Jacob[30] and McKenzie[31]. Some of these methods, however, are only applicable for *Str. agalactiae*. Whenever this organism, *Str. dysgalactiae*, *Str. uberis* or *Str. pyogenes* are isolated in properly taken udder samples it is generally considered to indicate a mastitis. With staphylococci and micrococci the question of mastitis is rather more difficult to decide. Micrococci are always, and staphylococci often, present in the udder without any other condition associated with mastitis (tissue response). One is then forced to take into consideration the question of numbers, and a count of over 50 staphylococci or of over 500 micrococci should be regarded with suspicion, especially if associated with any indication of tissue response. A total count of over 1,000 per ml. may be assumed to indicate a mastitis[6].

The Resazurin-Rennet Test[20]

The value of this test for udder samples lies in the fact that it gives in one simple operation a measure both of physiological (cell count) and chemical (*p*H and protein constitution) abnormality. A high cell content results in rapid reduction of the resazurin, and alkalinity and a high globulin : casein ratio in retarded clotting by rennet.

Technique

The apparatus required is as for the methylene blue test[32, 33], *viz.*, water bath at 37° C., 6 by ¾ inches (nominal) test tubes etched at 10 ml. and rubber stoppers to fit. In practice a properly controlled water bath is not absolutely necessary, as the test is only

required to distinguish abnormal milks and can easily be carried out in an ordinary domestic saucepan containing water at 38-40° C. Either resazurin powder or convenient tablets containing sufficient dye for 50 ml. of solution (0·005 per cent.) may be used. The rennet may be added as ordinary brine rennet (sterile) in which case 0·15 to 0·20 per cent. should be incorporated, or suitable tablets may be bought. The solution must be prepared fresh each day and it is advisable to use it within one hour of preparation.

Tubes are labelled and filled to the mark with the milk samples. One ml. of the solution is then added, the tube inverted slowly twice and placed in the bath. On no account should direct sunlight be allowed to fall on the tubes, and the tubes must be protected from light during the incubation period of one hour. The rennet concentration is so adjusted that, for the ordinary test, normal milk, *i.e.*, that from healthy udders, clots in one-half to three-quarters of an hour. Badly affected samples will remain unclotted after one and a half hours and usually turn the dye pink in one-quarter to one-half of an hour. For precise work comparator readings[34] should be made after one hour but there is never any difficulty in distinguishing the abnormal samples. If speed is essential a stronger rennet strength may be used, *e.g.*, to clot normal milks in five to seven and a half minutes, in which case the arbitrary limit becomes 15 minutes. This form of the test is, however, less accurate. The interpretation of the results is as follows :—

One Hour Test.—Resazurin blue after one hour, milk clotted in one-half to three-quarters of an hour : Normal. Resazurin mauve or pink after one hour, milk clotted in one-half to three-quarters of an hour : High in cells but normal in composition. Resazurin blue but milk not clotted in one and a half hours : Normal in cells but abnormal in composition.

Resazurin mauve or pink and milk not clotted in one and a half hours : High in cells and abnormal in composition.

Usually mastitis samples reduce the dye and fail to clot with rennet so that there is no difficulty in differentiating the abnormal samples.

It may be emphasised that the resazurin-rennet test is in no way to be regarded as a substitute for the plating, which in the opinion of the author cannot be avoided if an accurate knowledge of the incidence of mastitis is to be obtained. The value of this simple test is that it is the most informative of all the indirect tests and can easily be carried out by the veterinarian, the advisory or creamery bacteriologist, or the dairy instructress.

The Organisation of Testing

In practice the limiting factors for all control schemes such as this are expediency and cost. The technique described is considered to be the simplest and cheapest that can achieve the desired result. The cost of testing naturally depends on the numbers tested.

Income of Laboratory.—If we assume a charge of 9d. per sample (*i.e.*, 3s. per cow) per test, we may calculate the income as follows :—

Each pair of assistants takes and tests 100 samples (25 cows) per day for five days a week. Thus the laboratory would test 2,500 cows per week or 125,000 per year, which is equivalent to testing 60,000 cows twice a year and yields an income of £18,000 p.a.

It would thus be quite feasible for such a laboratory to be self-supporting. A farmer owning 17 cows (the average for the country) would pay 102s. p.a. and in return would get precise information not only about the incidence of mastitis in his herd but also the type and severity and the effect on the keeping quality of his milk. Mastitis is now well recognised by commercial dairy bacteriologists to be a cause of high counts in the milk of high-grade producers. In addition he would receive an assessment of the degree of chemical and physiological abnormality of the milk, which would be invaluable from the point of view of cheese-making or other forms of processing.

Under existing conditions farmers are reluctant to consult the veterinarian except when necessity compels. A regular bacteriological examination twice a year would be a far superior method for the control of the disease, as it would give the practitioner the necessary information in the early stages of the disease. The cost to the farmer is very slight in relation to the information he would obtain.

National Aspects of Mastitis

It is essential, in the consideration of any major problem in the dairy industry, to consider the national implications and to take the long view. It has been estimated that the loss to the country as a result of bovine mastitis is of the order of £3,000,000. If the Government were to pay half the cost of the scheme outlined, the expense to the country would be only £450,000 and we should gain by obtaining a purer and safer milk supply, a better keeping quality[6], a milk of higher nutritive value[4 5] and, in addition, remove many of the worries experienced by cheesemakers, condensers and creamery managers[35].

Speaking broadly, it is true to say that only the more knowledgeable and well-to-do farmers have their herds tested for mastitis. The usual method of "cleaning up" the herds is to sell the infected animals in the open market, with the result that the private menace becomes a public one. Creamery farm inspectors can, in fact, follow the itinerary of known infected animals from one farmer to another. It will be evident that the first step in any intelligent attack on the disease must be a national scheme which not only tests all animals, but effectively controls the movements of those infected, by branding or by slaughter and compensation when it is impossible to effect a cure.

Acknowledgments.—The writer gratefully acknowledges the encouragement and advice of Dr. A. T. R. Mattick and the technical assistance of Mr. H. J. Rogers.

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Professor H. D. Kay, addressing the session on Food and Agriculture of the "War Effort" conference organised by the Association of Scientific Workers recently held in London, pointed out that the present milk shortage was due to increased demand rather than to diminished supply, but emphasised that the present low yield per cow meant an inefficient use of feeding-stuffs. If scientific knowledge were applied to the control of udder disease and if milk recording became general this situation could be remedied. He asked that milk should be paid for on a quality basis [as recorded elsewhere in this issue, provision for this requirement will probably be made at an early date.—*Editor.*] and demanded scientific and technical training for the dairy farmer

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Tests made at Rowett Research Institute, Aberdeen, in the feeding of dairy cows showed that when silage was added to the maintenance ration of turnips, straw and hay at the rate of 20 lb. per gallon up to three gallons, the yield of milk, its quality and colour, were better than when the production ration consisted of concentrates.

CLINICAL COMMUNICATION

Dropsy of the Foetal Membranes in a Bitch

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Subject.—Golden retriever bitch. Age 7 years.

History.—She had been allowed to breed twice a year ever since maturity and it was estimated by the owner that she must have had 150 puppies during her life, as a normal litter numbered 10-12. On December 7th, 1941, when about six weeks pregnant, her abdomen started to enlarge and she went off her food. This process continued rapidly, until on December 10th, 1941, when one of us was called to see her, she was so big that she could only stand with difficulty. Breathing was difficult; her temperature was 100·8° F.

Dropsy of the foetal membranes was diagnosed, and destruction advised, but we were persuaded by the owner to attempt an operation.

Operation.—On the evening of December 10th, 1941, anaesthesia was induced with chloroform and maintained with ether and the usual hysterectomy was performed. An 8-inch midline incision was necessary. The chief difficulty was found in controlling the enormously enlarged uterus, as its weight tended to tear it away from its attachments. The extreme thinness of its wall made it very liable to rupture. The uterine vessels were not as large as we had expected and they presented no great difficulty.

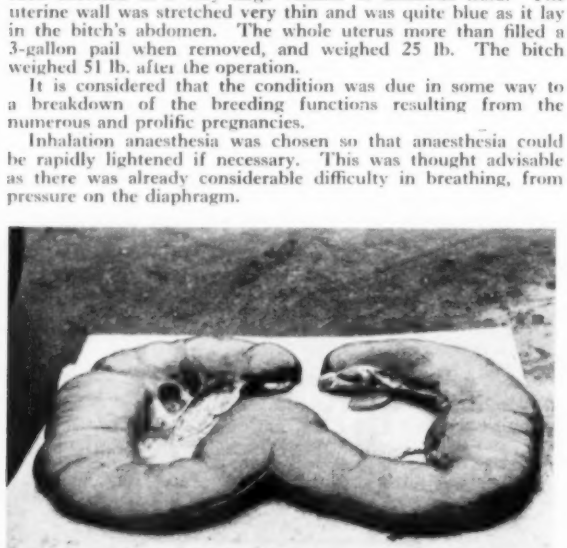
Within a few minutes of completing the operation the bitch was conscious, though very weak. She was kept warm overnight and at about 9 a.m. the next day appeared fairly bright and drank a little warm milk. Between 10 and 11 a.m. she became weaker and in spite of efforts to revive her she died at about 1 p.m.

Post-mortem examination.—This revealed no haemorrhage and the conclusion was that she died from delayed shock.

Remarks.—A photograph of the uterus and a foot-rule lying beside it is appended. The uterus contained eleven foetuses, each enclosed in a very large volume of amniotic fluid. The uterine wall was stretched very thin and was quite blue as it lay in the bitch's abdomen. The whole uterus more than filled a 3-gallon pail when removed, and weighed 25 lb. The bitch weighed 51 lb. after the operation.

It is considered that the condition was due in some way to a breakdown of the breeding functions resulting from the numerous and prolific pregnancies.

Inhalation anaesthesia was chosen so that anaesthesia could be rapidly lightened if necessary. This was thought advisable as there was already considerable difficulty in breathing, from pressure on the diaphragm.



WEEKLY WISDOM

"No one can be a good physician who has no idea of surgical operations, and a surgeon is nothing if ignorant of medicine."—(Lanfranchi, d. 1315.) [Text of Harvey Cushing's address "The Physician and the Surgeon" (1922).]

ABSTRACTS

[THE BACTERIOLOGY OF ACUTE MASTITIS. FERGUSON, JEAN. (1940.) *Cornell Vet.* **30**. 299-309.]

The author has investigated the bacteriology of 54 cases of clinically acute mastitis. In only one animal of this series was *Str. agalactiae* isolated and this was from a mixed infection. In the author's opinion acute mastitis is a separate entity from the prevalent chronic form caused by *Str. agalactiae*. These cases were obtained from 37 herds, four of which were known to have *Str. agalactiae* infections and six herds were considered to be free from this organism.

In most cases symptoms were severe and abrupt in onset. The affected quarter was swollen, hard and often sensitive to pressure. The discharge was abnormal, usually being entirely purulent in character. Where possible breed or ordinary smears of the secretion were examined, but in only four of 54 such specimens were bacteria detected.

Secretion was inoculated into litmus milk and horse blood agar plates and incubated. When necessary anaerobic methods of culture were also used.

In only one case was *Str. agalactiae* found and this was in company with other beta haemolytic streptococci. The most frequent cause of acute mastitis was coliform organisms which were isolated in 22 quarters. The symptoms were severe and in two animals terminated fatally.

Eight cases were due to infection with haemolytic staphylococci; six of these animals developed symptoms of sepsis and three died.

There were seven cases of infection with what the authoress calls beta haemolytic streptococci. The carbohydrate fermentations of these streptococci are tabulated, but unfortunately in only one case were the strains tested against group serum. This one strain was a Group C streptococcus.

Corynebacterium pyogenes was obtained from four cases, all of which showed severe symptoms. This organism, it is stated, is never found in chronic infections of the udder.

Streptococcus dysgalactiae (Mastitis Group II Streptococci) and *Streptococcus uberis* (Mastitis Group III Streptococci) were isolated from nine animals.

In 109 sub-acute cases of mastitis *Str. agalactiae* was present in 13. These 13 cases were probably flare-ups of chronic infections.

D. L. H.

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[*LISTERELLA* ENCEPHALITIS (CIRCLING DISEASE) OF SHEEP, CATTLE AND GOATS. OLAFSON, P. (1940.) *Cornell Vet.* **30**. 141-150.]

This paper is a summary of ten years' observations on naturally occurring cases of *Listeria* (*Listerella*) encephalitis in sheep, cattle and goats in New York State. The first outbreak was observed in 1931 in sheep but the organism was not recovered. In 1932 *L. monocytogenes* was isolated from sheep and the first cattle case was noted. In all, 25 outbreaks have been observed in sheep, 13 in cattle and two in goats.

Affected animals are at first depressed. A cow may find difficulty in finding its stall. Later the animal tends to lean for hours against a wall or pillar; on the second or third day it exhibits circling movements and paralysis of certain muscles may be apparent.

The lesions of the disease are confined to the central nervous system and can only be demonstrated histologically. Characteristic foci of cellular infiltration, in which the infecting organism can be found, may be seen in the brain parenchyma. There is also a marked perivascular cuffing.

Active immunisation does not appear to be very promising but a typical case in a sheep was cured by the prompt administration of prontosil and a cow was similarly cured with sulphanilamide.

J. S. P.

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[STUDIES ON *LISTERELLA*. II.—FIELD OUTBREAKS OF LISTERELLOSIS IN SHEEP AND CATTLE. GRAHAM, R., HESTER, H. R., and LEVINE, N. D. (1940.) *Cornell Vet.* **30**. 97-111;

III.—EXPERIMENTAL LISTERELLOSIS IN DOMESTIC ANIMALS. GRAHAM, R., DUNLAP, G. L., and LEVINE, N. D. (1940.) *Cornell Vet.* **30**. 268-290;

IV.—UNSUCCESSFUL ATTEMPTS AT IMMUNISATION WITH LIVING AND DEAD *LISTERELLA* CULTURES. GRAHAM, R., MORRILL, C. C., and LEVINE, N. D. (1940.) *Cornell Vet.* **30**. 291-298.]

II. The authors deal with listerellosis as observed in Illinois. Three outbreaks in sheep and three in cattle are described. The

mortality rate was not high. The symptoms described are in close accord with those detailed by Olafson (see above). The authors noted that, in those cases in which it was possible to carry out a blood-count, there was no increase in the number of circulating monocytes although in several cases there was an increase in the number of polymorphonuclear cells. Thus it would appear that mononucleosis is not pathognomonic of listerellosis of ruminants. It is of interest to note that some of the animals were submitted for examination because rabies was suspected.

III. The authors exposed small groups of animals of different species (horses, cattle, sheep, swine, cats, dogs and chickens) to artificial infection. Injections were made intracerebrally, into the conjunctival sac, intravenously and by the stomach tube. The results showed that *Listerella* are of low pathogenicity except when they are injected into the cranial cavity. Other routes of inoculation generally made the animals ill, but recovery ensued. Further evidence confirmed that a circulatory monocytosis is not a characteristic of listerellosis of ruminants.

IV. Relatively little protection was afforded to rabbits, guinea-pigs, sheep and chickens by single or repeated subcutaneous injections of formolised suspensions. Similarly, the subcutaneous inoculation of living organisms had no protective effect. A high-titre agglutinating serum of bovine origin did not confer any passive immunity. The test inoculations of virulent organisms were made intravenously in the rabbit, guinea-pig and sheep and intracerebrally in the chicken. J. S. P.

REPORT

[CENTRAL PROVINCES AND BERAR, INDIA: Report of the Civil Veterinary Department for the year ending March 31st, 1941. (Shahi, H. B.) (Government Printing, C.P. & Berar, Nagpur, Price, annas 12.)]

The newly appointed Director of Veterinary Services, Mr. H. B. Shahi, M.Sc., M.R.C.V.S., assumed charge on September 11th from the Director of Agriculture. The superior staff consisted of one deputy director, a veterinary investigation officer, an extra assistant director in charge of the Animal Husbandry Section, an officer in charge of the veterinary laboratory and three assistant directors. The subordinate establishment comprised seven veterinary inspectors, 145 veterinary assistant surgeons, and seven agricultural assistants.

Disease.—A very considerable amount of diagnostic work is recorded by the Central Laboratory which, in addition, produced a large number of doses of goat blood and tissue virus for dispensaries and quarantine stations. Disease investigation was pursued according to programme. The wide prevalence of coccidiosis in cattle was established and treatment taken in hand. The economic importance of Brucella infection is brought to notice in the report.

The year is stated to have been comparatively healthy, mortality from rinderpest showing a welcome decline. The quarantine stations appear to have done useful work. They have recently been established and are run economically. It would seem that further activity in this direction might lead to more satisfactory control of contagious disease. The number of veterinary dispensaries remained unaltered. They continued to do good work and meet a popular demand.

Breeding Operations.—The five cattle breeding farms maintained by Government for the production and supply of breeding bulls continued to function efficiently and an experimental farm for sheep breeding has shown satisfactory progress. Headway has been made with poultry farming at one of the farms.

Animal Industry.—An interesting section of the report relating to animal industry has been included for the first time. A serious attempt is being made to collate information from all possible sources with a view to subsequent activities in the Province. It may be hoped that this branch of rural economy will be developed by the department in future, and that the necessary facilities will be provided by the Government.

G. K. W.

At Darwen, Thomas Tomlinson, butcher and cattle dealer, was fined £100 in each of two cases for the unlawful slaughter of livestock and unlawful possession of meat. It was alleged he had a cow carcase he himself had slaughtered and dressed. A veterinary surgeon said the meat was inclined to be slightly dirty and some parts a little decomposed. Mr. A. J. Watson (defending) said the cow, becoming a casualty when in-calf, had to be slaughtered to prevent it becoming waste. It was worth about £70. If taken by the Ministry it would have yielded only £10 for carcase and 25s. for hide.

The Late Major G. W. Dunkin, M.R.C.V.S., D.V.H.

His Work at Mill Hill

"R. E. G." writes:—

His numerous friends and former colleagues at the National Institute for Medical Research have been profoundly grieved at the death of Mr. G. W. Dunkin. Other contributors have testified to his notable achievements in promoting the interests of the profession, but it is a privilege to speak of his outstanding contributions to veterinary science during the tenure of his office at Mill Hill.

In 1923 Mr. Dunkin was appointed by the Medical Research Council to the post of Superintendent of the Farm Laboratories, N.I.M.R. His selection for this position was particularly fortunate since his wide clinical experience proved to be invaluable in the investigation which was to follow. He was immediately faced with the formidable task of providing the necessary buildings and organising a staff for the experimental study of distemper. He had the advantage of the preliminary plans which had been drawn up by his predecessor, Professor Buxton, but there were many handicaps to be overcome. Fortunately, at an early stage he became associated with Sir P. Laidlaw and it is impossible to overestimate the importance of this happy union. The two collaborators were entirely dissimilar in training, in outlook and in temperament, but each had the utmost respect for the qualities which he recognised in his partner and they worked in perfect harmony during the many years of their association. The outstanding success of the distemper investigation culminating in the elaboration of the Dunkin-Laidlaw method of immunisation formed a fitting climax to many years of extensive study and will of certainty ensure the perpetuation of his memory.

It must not be forgotten, however, that the final triumph was not achieved without innumerable difficulties and heartbreaking delays. Distemper broke out in the normal puppies and drastic alterations in organisation were needed; in addition, the ferret stock was utterly destroyed by similar outbreaks on more than one occasion. In spite of these trials, he never lost courage as might have been the case with a man of smaller calibre, but with undiminished vigour set to work to rebuild with the utmost speed inspiring with his fervour those who were connected with the investigation. It can be truly said that the key to his success lay in his constant refusal to be daunted by any disaster.

Much of the "bench" work was contributed by Laidlaw, but the whole investigation might have remained in the stage of an interesting piece of laboratory work had it not been for the energy of Dunkin. Immediately a product had been elaborated which showed promise, he made close personal contacts with many members of the profession, with owners of hounds and indeed with all who were interested in the welfare of the dog. His enthusiasm was so infectious that he soon persuaded a large circle to test the distemper prophylactics under field conditions. The results were carefully tabulated and he constantly travelled from one end of the country to the other in his desire to probe every alleged failure of the method.

Prior to his appointment he had had little bench experience, but it was characteristic of his indomitable will and tireless energy that he mastered the complexities of laboratory technique and was soon plunged into investigations on the preparation of johnin and the diagnosis of Johne's disease, a subject which he regarded as of prime importance. His contributions to these problems were of the greatest value. He was also concerned with the creation of stocks of disease-free animals at Mill Hill and his projects were strikingly successful partly on account of his insistence on a rigid routine and partly on account of his capacity of impressing on his staff the need for meticulous care.

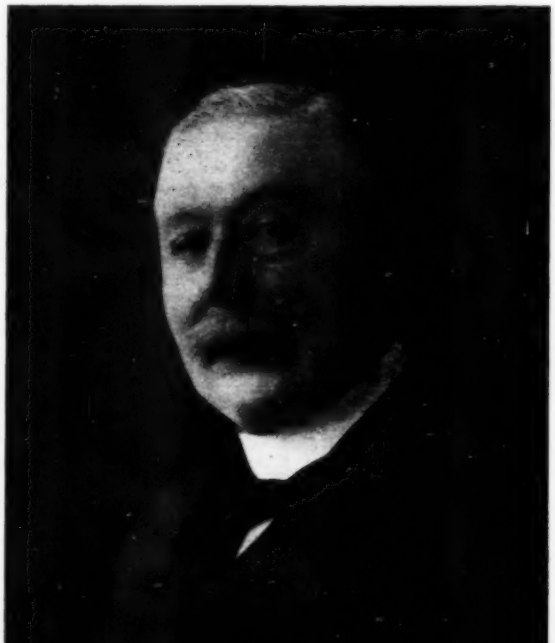
He was a stern disciplinarian but was beloved by his staff because of his strict sense of justice coupled with a deep regard for their welfare. His hospitality was without limit and he kept "open house" at Mill Hill. His scientific colleagues at the Institute, his numerous friends in the profession, distinguished foreign guests and scientific societies, more especially some of the Divisions of the "National," were welcomed at any time: all were privileged to share in his home life. His relations with his colleagues at Hampstead were most cordial. The sincere regret which was felt by all when he severed his connection with the Institute in 1937 was tempered by the pleasure at his appointment to a sphere which seemed to offer unlimited opportunities for his talents. It is indeed tragic that we should be impoverished by his untimely death at a period when his creative abilities and inspiring leadership, which were given full scope, were justifying his selection as the first Director of the Institute at Compton. In addition to a deep personal loss, his passing will leave a gap in the lives of his innumerable friends for it may be said with truth, that few members of our profession have enjoyed a wider measure of affection and esteem.

MEMOIR

William Woods, M.Sc. (Manc.) (Hon.), F.R.C.V.S.

As announced with deep regret in our issue of last week, the death of Mr. William Woods, of Wigan, took place on Monday, March 23rd, in his 82nd year.

With him has passed away one of the most familiar figures of the veterinary profession, and one of the best beloved. His father, William Woods, obtained the Veterinary Diploma of the Highland and Agricultural Society as a student of Dick's College in 1854, and took the R.C.V.S. Diploma Examination in 1866. His grandfather was in practice as a "Farrier" before the establishment of the College, and Mr. Woods was proud of the fact that his forbears for more than 200 years had been practitioners of the veterinary art.



Born in 1860, as a young man he served his apprenticeship with his father in the practice of veterinary surgeon; after undergoing a course of study in Edinburgh, he graduated a member of the Royal College of Veterinary Surgeons in April, 1881, and obtained his Fellowship exactly five years later, the earliest date then possible.

In 1890 he succeeded his father in the Wigan practice. At that time his father was a Vice-President of the R.C.V.S. and one of its Examiners. When he died in 1891 an examination was pending, and the President in the emergency called upon the son to take his father's place. He carried out his duties so well that in the following year he was re-elected and retained his office until 1937. This is a record of long service which is unlikely to be broken. He also acted as an Examiner for the Diploma in Veterinary State Medicine, and for the Fellowship Diploma.

In 1891, the year of his father's death, Mr. Woods was elected President of the Lancashire Veterinary Medical Association. His Presidential address at the annual meeting held at the Grand Hotel, Manchester, on February 26th, 1892—fifty years ago—shows how up to date and far sighted this young man of 31 was. He urged that the Government should introduce legislation for the control of glanders and tuberculosis. He pressed for the introduction of a general muzzling order throughout the country, instead of the institution of local orders following local outbreaks of rabies. By this means, and with a six months' quarantine he declared we could rid the country of this scourge.

He gave an account of his stewardship as an Examiner and defended the examination system which had recently been criticised. He approved of the proposal then on foot to institute a four years' course, and discussed the pros and cons of compulsory pupilage. He mentioned that he had been a student at the Alfort Veterinary School during the time of the Examinations there, and compared the French method of examinations with ours. He advocated a higher standard of preliminary education, and stressed the importance of a good knowledge of English.

Pleuro-pneumonia and glanders occupied much of the attention of the profession in those days and Woods was in the forefront of such research as was then possible. He collaborated with Dr. Fleming in trying out the effect of the newly discovered diagnostic agent "Mallein", which was destined in a very few years to permit of the eradication of this scourge.

Besides carrying on a very successful veterinary practice, Mr. Woods had acted as a teacher of veterinary hygiene, dietetics, and of sanitary law at the University of Manchester, which conferred upon him the Degree of Master of Science, and also as an Examiner for the Universities of Liverpool, London, Manchester, and Reading. Mr. Woods had been constant in his attendance at the meetings of the veterinary associations of which he was a member, and he had served in the most important offices attached to them. He had been prominent on the Council of the National Veterinary Benevolent and Mutual Defence Society, and a regular visitor at all veterinary congresses. He had indeed identified himself with his profession, and from the very beginning of his career he had consistently endeavoured to enhance its prestige, to add to its sum of knowledge, and, above all, to add lustre to it by the probity and gentlemanliness of his own personal conduct.

It was in recognition of the sterling worth of Mr. Woods that the Royal College of Veterinary Surgeons, at the ninety-fifth annual general meeting in London, on June 2nd, 1938, presented him with the John Henry Steel Memorial Gold Medal; this is a coveted special prize awarded by the College to benefit the profession by encouraging and rewarding merit, and in handing the medal to Mr. Woods, the President of the College remarked: "In complete confidence that I am expressing the sentiments of the whole profession, I present this gold medal to Mr. William Woods as a token of our recognition of his sterling worth, of our affection for him as a man, and our gratitude to him for his long life of devoted service to the advancement of the profession. I am sure that I am presenting this medal to one of the worthiest recipients to whom it has ever been or ever will be awarded."

Mr. Woods married Miss Annie Pennington Smith, a daughter of Alderman and Mrs. James Smith, former Mayor and Mayoress of Wigan and a sister of the late Mr. Arthur Smith, a former Town Clerk of Wigan, and latterly for many years Clerk to the Wigan County Justices. Mrs. Woods died in 1934. They had two children, Colonel W. T. Woods, D.S.O., M.C., who now holds an important position in the coal mining industry, and Mrs. Schofield, wife of the Rev. J. Schofield, formerly Vicar of Haigh and now Vicar of St. Faith's, Great Crosby. In 1920 the deceased gentleman was joined in partnership by Mr. William Walker, veterinary surgeon, who, the following year, succeeded Mr. Woods in the practice. For many years Mr. Woods was a member of the Lancashire County Cricket Club, and frequently attended the County matches.

The Funeral

The funeral took place on Friday, March 27th, when the service at the Wigan Parish Church was conducted by Canon W. O. Hunter Rodwell (Rector of Wigan), who spoke of Mr. Woods as a figure and a personality loyal to his borough and faithful to his church. "He was one of those characters which are all too rare, and he combined so many of those qualities which go to make up human goodness." Lovable and gentle as he was, Mr. Woods was firm and devoid of sentimentality. They loved him for his courage and dry humour, which was so typical of people of that part of the country.

The interment followed in the family grave at the Wigan Cemetery, where the committal rites were performed by the Rector, assisted by the curate, the Rev. H. Senar.

The private mourners included Colonel W. T. Woods, D.S.O., M.C. (son), and the Rev. and Mrs. J. Schofield, Great Crosby (son-in-law and daughter), while among the large general company were the Mayor of Wigan (Councillor R. Prestt, J.P.), Mr. Howell V. Hughes, B.V.Sc., M.R.C.V.S., D.V.H. (representing the Board of Veterinary Studies of the University of Liverpool), Mr. H. Raynor Hewetson, M.R.C.V.S. (President of the Lancashire Veterinary Association, representing the National Veterinary Medical Association), and Dr. G. O. Davies (Lancashire Veterinary Association).

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Apr. 11th.—Annual General Meeting of the Association of Veterinary Inspectors at the Imperial Hotel, Birmingham, 2 p.m.

Apr. 15th.—Meeting of the Section of Comparative Medicine, Royal Society of Medicine, at 1, Wimpole Street, W.1, 2.15 for 2.30 p.m.

Apr. 16th.—R.C.V.S. Committee Meetings, Hotel Russell, London.

Apr. 17th.—R.C.V.S. Committee and Council Meetings, Hotel Russell, London.

Apr. 17th.—Annual General Meeting of the Mid-West Division, N.V.M.A., at Bristol, 2.30 p.m.

Apr. 23rd.—Meeting of the Derbyshire Division, N.V.M.A., at Sutton Bonington, 2 p.m. for 2.30 p.m.

Apr. 24th.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds, 3 p.m.

May 11th.—R.C.V.S. Animal Management Examination begins.

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ARTIFICIAL INSEMINATION OF COWS

Large-Scale Practical Trials

The following announcement is made by the Ministry of Agriculture and Fisheries :—

"Artificial insemination of animals has been applied for some years in a number of countries. Advantages claimed for the practice are the lessening of the risk of spread of disease in livestock, reduction in sterility and increase in fertility, facilitation of improvement in quality, and economy in livestock management.

"Trials of artificial insemination of cows on a practical scale have been recommended by the Agricultural Improvement Council for England and Wales to be carried out in the first place at two centres, Cambridge and Reading, by the Cambridge School of Agriculture and the National Institute for Research in Dairying respectively, under the guidance of a Supervisory Committee and with the assistance of local committees for the two areas.

"The Supervisory Committee is as follows : Professor J. Scott Watson, M.A. (Chairman), Professor J. F. Craig, M.A., F.R.C.V.S., Messrs. J. H. Everall, John Hammond, M.A., D.Sc., F.R.S., Robert Hobbs, P. A. Mytton, O.B.E., C. Nevile and Captain J. Templeton."

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PERSONAL

Births.—At Tenterden Nursing Home, Amersham, on March 26th, to Lorna (née Moreton, late of the Royal Veterinary College), wife of Wilfred Tansley Harrow, M.R.C.V.S., of Dorking, a brother for Jennifer (Clifford).

At the Royal Nursing Home, Stafford, on April 5th, to Erica Isabel Thomson, M.R.C.V.S. (*née* Hollander), wife of Alexander Thomson, M.R.C.V.S., of Trefoil, Weeping Cross, Stafford, a son, named Adrian Alexander Gordon.

Marriage.—Barker—Beaumont.—On March 26th, at St. Peter's Church, Hereford, Joan, elder daughter of Mr. J. R. Barker, M.R.C.V.S., D.V.H., and Mrs. Barker, of St. Peter's Square, Hereford, to Lieut. Glynn Lloyd Beaumont, R.A.V.C., eldest son of Mr. J. W. Beaumont, M.R.C.V.S., and the late Mrs. Beaumont, Erlescote, Louth, Lincolnshire.

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R.C.V.S. OBITUARY

The Late Mr. J. F. Rees, M.R.C.V.S.

A Carmarthenshire colleague of the late Mr. J. F. Rees, whose career was recorded in a recent issue, forwards us the following tribute from "A mutual farmer friend" :—

"The death of J. F. Rees leaves a gap and severs another of the few remaining links with the sportsmen of the horse-loving period. He was a man of unique qualities ; neat in personal appearance, actions and his surroundings, dispensing and packing up his drugs with meticulous care. Never could it be said that he had slipshod methods. Living in the hub of all county activities his services were always freely at the disposal of the farming and sporting communities.

"His father was huntsman to the Maesgwyn Hounds. He trained and rode races, winning in his turn, and was an exhibitor of thoroughbred stallions at Islington, winning there 12 Queens' Premiums. "Jack" carried on the stallion showing, in conjunction with the late Vincent Thomas, their first horse being Pantaloon, bought from his father's executors. Amongst the other horses owned were Lousby, Scipio, China Cock, Don Pat and Pure Gold. Altogether, up to 1932 (when the showing and keeping of stallions was given up), he won five Super-Premiums and 46 Premiums—a truly grand record. His father started this business in 1869. West Wales breeders of hunters are indebted to the Rees's, father and son, for the lead they took in the breeding of grand and sound hunters."

Our correspondent himself sends the following note of appreciation :—

"As a veterinary surgeon may it be said on behalf of the profession that all of us held 'Jack Rees' in the highest esteem. We valued him as a man and practitioner. He gave of his best. He set up a very high standard, and we stand indebted to him for what he did in raising the status of the profession. His opinion was only given after careful consideration, and given fairly. He was ever able to put forth the reasons for his statements.

"He was Veterinary Surgeon to the Carmarthenshire County Council for 46 years, and to Carmarthen Borough Council for a longer period ; also to the Carmarthen Agricultural Society, The United Counties Agricultural Show, The United Counties Hunter Society and Show, Carmarthen Point-to-Point, and, until its demise, the Carmarthen Racecourse. His was a household name in West Wales."

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GENERAL OBITUARY

Professor John Lindsay

Dr. John Lindsay, Professor of Physiology and Histology in Glasgow Veterinary College, died on March 20th, 1942, aged 77 years.

Dr. Lindsay received his early medical training at Glasgow University, obtaining the degree of M.D. for post-graduate work in embryology. Leaving the University he took up general practice in Glasgow.

In May, 1902, Dr. Lindsay was appointed to the staff of the Glasgow College and during his 40 years of service he won the respect and admiration of everyone with whom he came in contact. He was a man of great depth of character who combined understanding and tolerance with a firm discipline, characteristics which with his marked scholastic ability, made him outstanding as a teacher.

Whilst not a member of the veterinary profession, Dr. Lindsay had an extensive knowledge of all aspects of veterinary science. Despite advancing years he retained a vital interest in our profession, continuing his activities until a few days before his death. In addition, he found time to make a comprehensive study of certain aspects of ancient Scottish history and law. He was an active member of the Clan Lindsay Society and shortly before his death he published a booklet on the history of this clan.

His death leaves a gap in the ranks of our profession and of the Glasgow Veterinary College in particular, and those who have passed through his hands will feel that it is to them a great personal loss.

R. N. C. A.

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HIGHER PRICES FOR DAIRY FARMERS: DRIVE FOR MORE MILK

As from April 1st the Government has increased milk prices to producers for the ensuing 12 months by an average of 2d. a gallon, compared with those originally announced in February, 1941. In making his statement about the new prices, Mr. R. S. Hudson, Minister of Agriculture, announced a new drive to increase milk production by raising the standard of dairy farming and the health of Britain's herds.

County war agricultural executive committees have been told to exercise closer supervision over the less efficient producers, and to discover the reason for, and remedy, any fall in yield. The Minister believes that an increase in yield of at least 10 per cent. can be brought about this year. Committees, in the national interest, will not hesitate either to dispossess a farmer who attempts to go out of dairying, or to order him to retain his herd.

The price increase will be arranged to encourage winter production. It will average 1·37d. a gallon for the six summer months and 2·78d. for the winter. This will bring the average price in England and Wales to 17·35d. and 29·21d. a gallon for the respective seasons. If for any unforeseen reason production costs were to rise materially the Government will consider a retrospective price adjustment.

The Government is satisfied that the new prices fully cover increases in production costs, and will provide farmers with a reasonable return, but the National Farmers' Union has expressed concern at the prices and stated that if production fell it would be because production costs were not covered.

Commenting on the subject, the Agricultural Correspondent of *The Times* says: "Every county has been given a milk

production 'target' for the coming year. It will take a big effort in some districts to obtain the required gallonage. The monthly output from every herd is to be reviewed by the War Agricultural Committees and those farms which show poor records are to be visited to see how matters can be improved. In this way the experience of progressive management and, it is to be hoped, the experience of veterinary science in combating the diseases that check milk yields can be applied with good effect in many herds that do not now attain a satisfactory output."

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TEST BASIS FOR MILK PRICES

Under the above heading *The Farmer and Stock-breeder* of March 24th observes: "Details are now available of the scheme which is proposed for the control of milk quality by the making of payment to farmers on a quality basis. Responsibility for the scheme would rest with the Ministry of Agriculture, says a correspondent, and it would be operated by the Milk Marketing Board as their agents. Adequate dairy education staffs will be maintained in every county to ensure that advice is available to every producer whose milk fails to pass the test and who, in consequence, suffers a financial penalty. An advisory committee, on which the Ministries of Agriculture, Food and Health, the Milk Board, the National Farmers' Union and the distributive trade are represented will be formed to advise on the operation and development of the scheme.

"All milk, including designated milk, sent from farms to any destination will be liable to test. Methods of sampling and testing will be standardised throughout the country. So far as practicable testing will be carried out in trade laboratories, all of which will be licensed by the Ministry of Agriculture. Two of the main conditions attached to a licence will be that the laboratory and every certified tester must be approved by the Provincial Dairy Bacteriologist. In the case of dairymen who have no laboratory or technical staff, the Milk Board will appoint certified testers to test milk at the point of first delivery. Dairymen will be permitted to make arrangements for the testing of their milk by other firms within a limited radius that possess laboratories. The Provincial Dairy Bacteriologist will conduct frequent check tests.

"Milk to be price penalised will be the whole or part of a consignment of morning or evening milk which is considered unsuitable for the liquid market by the platform examiner or by the tester. Price-penalised milk (to be known as 'Salvage' milk) will normally be used for manufacturing purposes; but if milk is unfit for any purpose it will be returned to the farmer or otherwise disposed of and no payment will be made. Records of all tests must be kept. The Milk Board must be notified immediately of any supplies that fail to pass the test for the liquid market ('Market' milk). County authorities must be given notification weekly of such failures.

"No payment will be made to dairymen for conducting tests in their own laboratories of milk they purchase, but a small fee per test will be payable for tests conducted on behalf of other dairymen. Special testers appointed by the Board to examine the milk of producer-retailers and of dairymen who have no laboratories will be paid by the Board.

"The extent of the financial penalty to be imposed on farmers whose milk fails to reach the standard for the liquid market will be determined by the Milk Board in consultation with the Ministry of Agriculture and the Ministry of Food.

"The scheme also contains provision for dealing with complaints of unsatisfactory milk collection, unsterile churns, delay in testing and so on, and the respective liabilities of producers, hauliers, laboratories, the Milk Board, dairymen, and the Food Ministry will be prescribed.

"At the outset the scheme will be applied mainly to depot and creamery bulked milk destined for distant markets, and will be gradually extended."

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SAMPLING FEEDING-STUFFS: NEW POWERS

The Minister of Food has made an Order giving sampling officers the power to take samples of feeding-stuffs. In a reply in the House of Commons to a question as to what arrangements were made by the Ministry for testing and analysing samples of fertilisers and feeding-stuffs, Mr. Hudson said there was no statutory provision for the analysing of materials sold without a warranty as manures or fertilisers which were not covered by the Fertiliser and Feeding-stuffs Act, 1926, but farmers should be sufficiently experienced not to buy an article the fertilising value of which was out of proportion to its price. In the case of most feeding-stuffs it was also possible for action to protect the purchaser to be taken under Ministry of Food Orders.

JOHNIN TEST: SLAUGHTER OF REACTING CATTLE

"The Ministry of Food are not accepting for purchase cattle or sheep presented for grading at a collecting centre if, in the opinion of the certifying authority, they are in store condition or are pregnant and should be kept on," states the Ministry of Agriculture in a recent announcement, which continues: "It is, however, of the greatest importance that cattle suffering from Johne's disease should be slaughtered without delay. Owners of such cattle should consign them to collecting centres in the usual way and satisfy the certifying authority that the beasts should be taken for immediate slaughter, even though they may be in store condition."

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LEGAL NOTES

"*Failure to Lie Down*" *Ruled an Equine Vice.*—"It is well known that horses will sometimes unaccountably refuse to lie in one place while doing so quite normally in another. Such failure to lie constitutes a vice which tends to impair the working capacity of the animal." This was the legal ruling with regard to a horse which would not lie down at the farm when bought by Mr. John Lyburn, Grange of Elcho, near Perth. He purchased the animal at £91 from A. Lumgair, farmer, Gask, Letham, Angus, in June last year. Litigation followed at Forfar Sheriff Court and Sheriff MacKinnon, giving his judgment in favour of Mr. Lyburn, who sought the return of his purchase price on the grounds that the horse was not up to warranty, made the comment quoted above.

The Sheriff found that Mr. Lyburn gave the horse a fair trial. He returned it, and on test at Perth Mart, it lay down. The animal was given another trial by purchaser, but again it would not lie down, and he once more rejected it. The horse was eventually sold at Perth for £78 without warranty.

In his notes, Sheriff MacKinnon states: "A horse may, through transference to strange surroundings, be temporarily upset for a day or two, but the criterion of its acceptability is its behaviour with its new owner after being given a fair trial. It may seem rather hard on the defender that his horse should display a vice hitherto unbeknown to him, but it would also be very hard if a purchaser on a warranty should suffer thereby.

"In this dispute I am in the unusual position of feeling myself able to reach a decision while substantially believing the evidence on both sides. I am quite ready to accept the testimony adduced that this horse lay down regularly while in the defender's possession and also at the Mart in Perth."—*Farmers' Weekly.*

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CONTROL OF LIVESTOCK DISEASE IN THE IRISH FREE STATE

Addressing a meeting of the University College, Dublin, Agricultural Society, Professor W. Kearney, M.R.C.V.S., of the Royal Veterinary College of Ireland, said that in the near future the number of veterinary surgeons in the country would be sufficiently large to enable the profession to take a more active part in "this work of national welfare," livestock disease control and eradication, and the time had arrived when stock-owners, in their own interests, would be well advised to avail themselves of veterinary science to a fuller extent than heretofore. Economy in farming operations was of first-rate importance to the country and the wastage from livestock disease was one of the urgent problems. Having described the work of the Royal Dublin Society in promoting veterinary education, Professor Kearney said that veterinary medicine, unlike ordinary medicine, was not catered for sufficiently in the way of post-graduate specialisation. He recommended the making of university science degrees available for veterinary students and graduates.

In conclusion, Professor Kearney appealed to the farmers to take an active interest in any scheme for the maintenance of a higher standard of health among their animals and thus save themselves and the country the considerable financial loss incurred by animal disease.

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SUMMER RATIONS FOR LIVESTOCK

For the summer (states a Ministry of Agriculture announcement) farmers will not be required to register afresh with suppliers, but if they wish to change they must apply to their County War Committees before April 25th. Rations will be on a similar basis to those of last summer. Allowances for dairy herds will be granted only where monthly average milk yields reach certain figures, and small allowances will be available for calves under 6 months old. Rations for goats and kids will be allowed on a similar basis to those for cows and

calves. The winter allowances for pigs will be continued, whilst those for poultry will be increased by 50 per cent. from May to August inclusive. The supplementary allowances for sound poultry breeding stock and pedigree pigs will also be continued at winter rates. Allowances for agricultural horses will be granted on proved need, and provision is made for certain special allowances for other stock to be obtained on appeal.

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MINISTRY OF AGRICULTURE NEWS SERVICE

More Calves Next Winter

War-time Planning in Herd Management.—Cows and heifers calving down in the autumn and winter are vital for the production of milk at a time when it will be most needed. They are shy breeders in winter. Heat periods are of much shorter duration than in the summer. If the bull is kept isolated from the cows and heifers, successful breeding in winter depends upon the cowman watching for signs of heat periods. Day services can be arranged easily, but cows that come on heat during the night may be missed.

Although precise records of service dates are not obtained, more certain breeding may take place during winter by running the bull with the cows or heifers that are on grass, or that lie in yards during the night. A careful inspection in the morning may indicate the matings. Where cows are kept tied up during the night the chances of missing heat periods are reduced if the cowman makes a careful inspection last thing at night and first thing in the morning. If milk recording is practised, a slight rise or fall in the milk yields of individual cows may be an indication. By carefully noting such times it may be possible to secure a service, or alternatively to place the cow with a bull during a probable future period. Service in winter-time is essential to the maintenance of production in the following winter.

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Farm Water Supplies

Government Grant for Groups of Holdings.—The Government scheme originally intended to assist financially in the supply of water to upland pastures has now been extended to other agricultural land. Cow-sheds and dairies are also included. Dairy farmers may not have appreciated that an approved building is now eligible for a 50 per cent. Government grant towards the cost of a water supply. The grants are intended primarily to assist the supply of water to groups of holdings, but in exceptional circumstances applications relating to individual holdings will be considered. An explanatory memorandum and form of application for grant may be obtained from County War Agricultural Executive Committees.

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Kale for Protein

A Crop that Helps the Coupons.—Kale is one of the most useful crops on the farm. It is a heavy yielder, needs little or no hoeing compared with other "root" crops, and has a high protein content. Unfortunately kale is subject to attacks of "fly." Early sowing is the best way of safeguarding the crop from attack.

If the weather permits, sow by the end of March. Given a good tilth, and a generous nitrogenous manuring, the plant will have spread its broad leaves by the time the fly becomes prevalent, and the necessity for re-drilling will be removed.

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Rubber is Scarce

Look after the Milking Machine.—Rubber is scarce and farmers are asked to economise in its use. For instance, the rubber tubes and teat cup liners of milking machines must be made to last a long time.

Never allow milk to dry on the inside of the tubes or liners. Dried-on milk cannot be removed without damaging the rubber. Water should be run through the machine just as soon as each milking is finished.

When the rubber parts are being sterilised they should not be put directly into a metal steam chest. The contact of metal and rubber at this high temperature takes the springiness out of the rubber and makes it sticky. The rubber parts should be placed into a muslin bag and the bag suspended in the steriliser.

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Ponder These Things

An acre of kale and mangolds will give more than three times as much winter keep for stock as an acre of meadow.

One acre of sugar-beet will produce in tops and pulp alone, the same amount of food for stock as its equivalent meadowland acreage, and nearly twice as much human food as an acre of wheat.

The average yield of wheat from one acre contains food value seven times as high as that of the beef that can be produced on the same area of the best pasture.

Whatever kind of food is considered, plough land will give more than grassland.

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Pig Meat from Waste.—The campaign conducted by the Small Pig Keepers' Council has now reached a point where household scraps are mainly responsible for an annual output of 7,000 tons of pig meat. Mr. Cedric Drew, M.P., chairman of the Council, has announced that pig clubs number more than 2,100. At the height of the Battle of Britain there were—26! Sixty thousand members are now feeding 50,000 pigs. The vast majority of the clubs are in urban areas—the source of the waste food. It is hoped, however, that more clubs will be formed in country districts for farm workers and others. Full information can be had from the Small Pig Keepers' Council, The Barn, Turville Heath, Henley-on-Thames.

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Re-Seeding and a Six-fold Increase in "Milk per acre."—The Minister of Agriculture has related how, on an upland farm in East Lancashire, 800 to 900 feet above sea level, remarkable results were achieved by ploughing-up grassland and re-seeding it. Before treatment the grassland produced hardly anything. It was, in fact, merely an exercising ground for the animals. After ploughing and re-seeding it produced 6½ times what it did before. In other words, the milk yield went up from 54 gallons an acre to over 350 gallons an acre, and now lambs are being fattened off on the land.

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.
The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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ENTERO-TOXAEMIA IN GOATS

To the Editor of The Veterinary Record

Sir,—I read Dr. Barron's article under this heading with considerable interest, and on asking him the identity of the herd I found it to be the one in which I had treated a similar case last spring. I was informed at the time that Dr. Barron had investigated previous cases there, and that he had diagnosed *Cl. welchii* infection, and this gave me the idea of treating the goat with M & B 693. I think details of the symptoms and treatment may be of interest.

In the evening of April 28th, 1941, the goat, a female, was suffering from diarrhoea and looked very sleepy. Temperature was 106° F., breathing was accelerated and sounded "rough" on auscultation. Fifty c.c. Bayer lamb dysentery serum was given subcutaneously and 10 gm. M & B 693 was given by the mouth. Kaolin poultices were applied to the chest wall, to be repeated every 12 hours.

The next morning (April 29th, 1941) the goat appeared much brighter and the temperature was 102·4° F. The faeces were much less liquid. Five gm. M & B 693 had already been given early in the morning and was followed by 2 gm. every eight hours. The total dose given was 27 gm.

I next saw the goat on May 1st, 1941, when she appeared quite normal.

My impression at the time was that the sulphonamide had taken a more active part in effecting the cure than the serum, but this was, of course, only an impression.

On May 16th, 1941, the 16 other goats in the herd which were deemed by the owner to be worth the expense and trouble, were given 5 c.c. Bayer lamb dysentery vaccine each. It must have been seven or eight months after this that the further death referred to by Dr. Barron occurred.

Although I did call Dr. Barron's attention to the case at the time of the occurrence, I fear that it was due to imperfect liaison on my part that he omitted this case from his article, and I therefore tender him my apologies.

Yours faithfully,

14 & 16, Queen's Road, Reading. F. R. Spratling.

"PREVENTIVE" OR "DEFENSIVE" MEDICINE?

To the Editor of The Veterinary Record

Sir,—Ever since 1796, when Edward Jenner discovered "Vaccination," the writing has been on the wall, that here lay the pathway to successful eradication, or to the control of diseases of microbic origin. Some 90 years later, from his obscure little village near Kharkov, the young Russian physician Mechnikov gave to the world the scientific basis for the "Vaccine," and disclosed the physiological offensive mechanism of the human and animal body against microbic invaders. Since then the pathway has become a "main road," and at intervals along it are many "milestones" inscribed with the names of many scourges, human and animal, over which preventive medicine has triumphed: rabies, typhoid, typhus, tetanus, diphtheria, blackquarter, distemper, lamb dysentery—to name some on the list. In all of these, the indispensable weapon of victory has been the vaccine or serum, conferring active power of assault by the body mechanism upon the invading organism or virus. It would therefore appear that at present our main hopes of new conquests lie in the discovery of the specific vaccines or serums appropriate, unless fresh discoveries in biochemistry reinforce our armoury. All this may be very trite, but my purpose is to ask whether as a profession or as individuals we are not in danger of losing sight of the true preventive weapons, and of dissipating or diverting our energies and the resources of research to methods and channels which at best are only "second best." The attempt to control or eradicate contagious abortion by blood testing, isolation, and the culling of the affected animals, is one example of a departure from the pathway of Jenner. Another is the campaign against tuberculosis by tuberculin testing and isolation. Neither of them is true preventive medicine in the essential sense. If one had to define these methods with the brevity of a slogan, I would suggest that they are only "defensive medicine." And not even defensive in the sense that the potential victims of attack are armed to strike back, but only in the sense of an army which entrenches itself within an expensive and laboriously constructed fortress, or unarmed Maginot Line, in the hope that by unwearying vigilance the enemy will fail to gain entrance. True some temporary success can be, and has been attained by such defensive strategy. True, also, that we have to fight with what weapons are to hand until the best are available. But are we not in danger of becoming satisfied with these present weapons, becoming lulled into a state of complacency just because we are "doing something," and perhaps even finding comfort in the grist which comes into our financial mill? Much time, money, and energy, has for many years been expended both within our profession, and—led by us—by the stockowner in pursuing these defensive measures, and the results to date are far from encouraging. In his outspoken address to Council reported in your issue of October 11th last, Mr. Steele-Bodger, referring to these two main animal scourges, asked if we "are not pursuing shadows" in our present methods of dealing with them, and the question seems urgently to need answering. Fortunately there seems to be the near prospect of a return to the path of Jenner in respect to contagious abortion, and it is also good to know that both medical and veterinary workers are, by researches on the vole bacillus, treading the same path. Even if neither should wholly succeed, the efforts will have been justified, because at least they are upon the real and not a false trail. Can we not look forward to a time when a more generously endowed and reinforced body of research workers will be released from following these by-ways, and more warmly encouraged to employ their time and energies toward reaching the wide though difficult road where the "milestones" of victory stand. Let us at least not be content with a medieval "pike," whilst there is the chance of discovering a life-giving "charge" for use in our "hypodermic gun."

Yours faithfully,

Sandy Lane, E. P. Edwards.
Prestatyn, N. Wales.
March 26th, 1942.

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STAFFING THE VETERINARY INSPECTORATE

To the Editor of the Veterinary Record

Sir,—I notice in a recent issue of *The Veterinary Record* that Colonel Carver asked the Minister of Agriculture whether, in view of the nation's need of manpower, he would consider utilising the services of qualified women as veterinary inspectors, to avoid the necessity of employing men of military age, and Mr. Hudson informed him that veterinary surgeons of all ages were exempt.

Those of us who have successfully practised, for the last 40 years, as veterinary surgeons and veterinary inspectors to the Ministry, know very well that a great many of the young people (men and women) who are qualifying to-day would be far better employed serving their country in the war than in veterinary practice. It is a terrible thing to have to admit, but, nevertheless, it is true, that a high percentage are no use at their job; their lack of practical knowledge is pathetic, and yet there are scores of qualified men all over the country who have had to give up their inspectorships because they had reached the age of 65, many of them good enough for another 10 years. I saw two such, in a market last week, with nothing to do. It seems to me the Ministry are very short-sighted in not having utilised these practical men, at least until the end of the war.

Yours faithfully,

Stourbridge, Worcs. James Robertson.
March 30th, 1942.

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THE PROFESSION AND PUBLICITY

To the Editor of The Veterinary Record

Sir,—We are interested to see a letter in *The Veterinary Record* dated March 21st, referring to the educational advertising campaign which is being conducted by this Company in the farming press.

It might perhaps be opportune to point out that such prestige publicity employed by a private firm, if new in this country, is a well recognised form of co-operation between the manufacturer and the professions in the U.S.A. Certain commercial firms in that country who depend solely on professional distribution, keep their name and their object before readers of the lay press, and such advertising embraces both medical and veterinary interests.

Apart from strictly ethical considerations, we take the view that if our business policy is the correct one, and we are convinced that it is, then the only opportunity we have in the lay press is to detail our policy to the stock-owner. Farming papers are largely used by advertisers who favour direct or indirect sales to potential users. The appeal and power of private advertising is an admitted force, and we have reason to believe that our announcements have been responsible for a number of stock-owners revising their views on the question of animal health. Our publicity certainly presents the other side of the picture and coming from a commercial firm from whom the farmer normally expects the offer of supplies, the appeal takes on an added significance.

In the recognition of the true value of the veterinary profession, and the great urgency of the problems awaiting them, it is apparent that every legitimate step must be taken to arouse interest if the country is to secure the benefits for which there is the direst need. We hope, therefore, that our own small effort in this direction will carry its appropriate weight.

With compliments and thanks,
We are,
Yours faithfully,

Pharmaceutical Specialities (May & Baker), Limited,
J. Adam,
Managing Director.

Dagenham.
March 31st, 1942.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV)

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
Mar. 1st to 15th, 1942	11	1	4	7	14
Corresponding period in—					
1941 ...	24	38	1	5	66
1940 ...	25	2	—	8	131
1939 ...	31	3	3	10	68
Total Jan. 1st to Mar. 15, 1942	67	11	13	87	87
Corresponding period in—					
1941 ...	112	115	5	79	506
1940 ...	129	14	8	82	789
1939 ...	208	29	17	129	277

Note.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.